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Rapid Qualitative Research Methods during Complex Health Emergencies: A Systematic Review of the Literature

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ABSTRACT

The 2013-2016 Ebola outbreak in West Africa highlighted both the successes and limitations of social science contributions to emergency response operations. An important limitation was the rapid and effective communication of study findings. A systematic review was carried out to explore how rapid qualitative methods have been used during global heath emergencies to understand which methods are commonly used, how they are applied, and the difficulties faced by social science researchers in the field. We also asses their value and benefit for health emergencies. The review findings are used to propose recommendations for qualitative research in this context. Peer-reviewed articles and grey literature were identified through six online databases. An initial search was carried out in July 2016 and updated in February 2017. The PRISMA checklist was used to guide the reporting of methods and findings. The articles were assessed for quality using the MMAT and AACODS checklist. From an initial search yielding 1444 articles, 22 articles met the criteria for inclusion. Thirteen of the articles were qualitative studies and nine used a mixed-methods design. The purpose of the rapid studies included: the identification of causes of the outbreak, and assessment of infrastructure, control strategies, health needs and health facility use. The studies varied in duration (from 4 days to 1 month). The main limitations identified by the authors were: the low quality of the collected data, small sample sizes, and

little time for cross-checking facts with other data sources to reduce bias. Rapid qualitative methods were seen as beneficial in highlighting context-specific issues that need to be addressed locally, population-level behaviors influencing health service use, and organizational challenges in response planning and implementation. Recommendations for carrying out rapid qualitative research in this context included the early designation of community leaders as a point of contact, early and continuous sharing of findings, and development of recommendations with local policy makers and practitioners.

Keywords

Rapid qualitative methods, complex health emergency, systematic review, rapid appraisal, epidemic, natural disaster, qualitative health research

1. INTRODUCTION

In December 2013, a toddler from the Kissi region of Guéckédou Prefecture died of a sudden and mysterious illness – months later confirmed as Ebola – in a village near Guinea's border with Sierra Leone and Liberia (Baize et al. 2014; Saéz et al. 2014). In the weeks, months and years to follow, the virus would spread throughout the West African region and beyond with over 28,000 people infected and over 11,000 deaths – a case rate nearly 70 times more than that of the next largest Ebola outbreak in history (WHO 2016). One of the most confounding aspects of the outbreak was the staggering inaccuracies of early disease models which were unable to predict how the basic reproduction number of Ebola would react in a regional environment with: 1) governments severely weakened by decades of corruption and civil war, 2) failing health care systems, 3) distrust between local populations and governmental figures, 4) extensive trading networks and patterns of mobility through porous national borders, 5) spread of the outbreak from rural locations to large, densely populated urban centers, and 6) burial rituals involving intimate contact with the deceased (a period in which viral loads are at their highest peak) (Abramowitz 2015; Aylward et al. 2014; Benton and Dionne 2015; CDC 2014; Chowell and

Nishiura 2015; Faye et al. 2015; Leach 2015; Richards et al. 2014; Wilkinson and Leach 2015). These were all contributors to the unprecedented spread of Ebola in West Africa in the 2013-2016 period, and all of these factors would later be extensively analyzed by social scientists with experience working in West Africa.

That social scientists have contributed to better understanding and responding to natural disasters and disease outbreaks, even past outbreaks of Ebola, is not a new phenomenon (Henry 2005; Hewlett et al. 2005; Hoffman 2005; Koons 2010; Oliver-Smith 1979; Scheper-Hughes 2005; and Williams 2001 to name a few). What was new during the Ebola outbreak in West Africa, was the extent to which the contributions of social scientists were discussed and debated among global emergency response teams and their assistance actively, explicitly and openly recruited by international outbreak response organizations such as the WHO and UNICEF. For example, six months after health officials announced the Ebola outbreak, WHO made the unprecedented move to create the first-ever UN emergency health mission, UNMEER, with the core objective of scaling up the on-the-ground response to the outbreak. WHO explicitly recruited social anthropologists to work during the 'UNMEER phase' of the Ebola response and beyond UNICEF's Communication for Development (C4D) teams also made an effort to recruit anthropologists and other social scientists to work as embedded researchers in West Africa in support of the 'Social Mobilization' and/or 'Community Engagement' pillar of the response. Indeed, social scientists embedded in the response and those working remotely within their respective academic institutions were able to contribute key insights into the 'resistance' of communities following the unpopular dictates of public health response personnel, identify areas where public health goals and community sentiment aligned, highlight sensitive issues regarding the impact of Ebola on women's reproductive health and rights, and emphasize the unique cultural pathways for Ebola transmission

during funeral ceremonies (Abramowitz 2014; Allen et al. 2015; Anoko 2014; Epelboin 2015; Fairhead 2014; Ferme 2014; Johnson and Vindrola-Padros 2014; Richards and Mokuwa 2014).

What is equally true, however, is that public health officials had difficulty digesting the information provided by social scientists and often were unable to transform their qualitative data and expert observations into real-time recommendations for responding to a deadly, on-going outbreak. For example, WHO convened a multi-stakeholder review meeting in November 2015 of emergency risk communicators and community engagement personnel to outline how anthropologists and other social scientists working during the outbreak, could have improved their performance. Challenges encountered by social scientists working during the outbreak also increased due to the late stage of the response in which their expertise was sought and the lack of acceptance of social science knowledge by some policymakers and health workers. As stated by Martineau, coordinator of the Ebola Anthropology Response Platform (a network that connected social scientists and outbreak control teams), social scientists may have belatedly found themselves a seat 'at the table' but were often unable to achieve their aims (Martineau 2015).

Social scientists themselves have alluded to the "quick and dirty" (Brennan and Rimba 2005:342; Menzel and Schroven 2016: para 22) methods often utilized because "in times of crisis…everything needs to happen fast" (Menzel and Schroven 2016: para 22). However, statements such as these both conflate 'quick' with 'dirty' and negate a formal evaluation of rapid methodologies which can, with discussion and critical reflection, be improved upon to contribute valuable information to those responding to health emergencies. Much of the debate on the use of rapid methods vs. long-term research has centered on issues such as building rapport with local communities, capturing the insider's perspective, understanding the complexity of situations, documenting how beliefs and practices change through

time, and corroborating data and interpretations (Bernard 2011; Chambers 2008; Pink and Morgan 2013; Wolcott 2005). Traditionally in the social sciences, a notion has prevailed regarding the relationship between the length of fieldwork and the accuracy, quality, and trustworthiness of the data, where rapid research designs are not valued or assessed in the same way as studies that require the long-term involvement of the researcher in the field. However, recent work has highlighted that in-depth qualitative research can be produced through short-term intensive fieldwork (Beebe 2014; Pink and Morgan 2013). Furthermore, rapid qualitative research promotes community engagement and can inform decision-making with regards to pressing social issues in a way that might not be possible in longer research projects (McNall and Foster-Fishman 2007; Trotter and Singer 2005).

In recognition of this, the authors – both of whom are anthropologists who were involved in working with Ebola response agencies during the outbreak – wanted to better understand the extent to which social science research, and qualitative methods more specifically, have been applied to past outbreaks and other complex health emergencies. The primary goal in conducting this systematic review of the literature was to explore the ways in which rapid qualitative methods have been used during on-going, global heath emergencies of the last 15 years in order to better understand which methods are commonly used, how they are applied, the benefits and limitations of using these methods, and the difficulties faced by researchers in the field. Additionally, this review explores how the researchers themselves describe their use of rapid qualitative methodologies, the trustworthiness of the data, and use of research findings to inform the rapid decision-making processes required in responding to emergencies. The ultimate goal of this review was to learn from previous applications of rapid qualitative methods during complex health emergencies and propose recommendations for future research.

2. METHODS

2.1 Design

This is a systematic review of the literature. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement was used to guide the reporting of the methods and findings (Moher et al. 2009). The review was registered with PROSPERO (reference number: CRD42016049797).

2.2 Research questions

The research questions guiding the review were:

1. What are the most common methods of qualitative data collection and analysis during complex health emergencies?
2. What are the study timeframes?
3. Who are the most common data collectors engaged in this type of research (i.e. sociologists, anthropologists, psychologists, etc.)? What are their affiliations (i.e. academic, I/NGO, governmental, etc.)?
4. How are qualitative methods adapted to respond to rapid timeframes and emergency/disaster phases (i.e. planning, mitigation, response, recovery, evaluation)?
5. What are the main contributions of rapid methods?
6. How (if at all) was data translated/used/actionable during the response?
7. What are the challenges/limitations to conducting rapid qualitative research during health emergencies?
8. Are there any lessons learned from applying rapid methods in heath contexts that can be relevant for other emergency contexts?

2.3 Search strategy

We used the Population-Intervention-Comparison-Outcomes-Setting (PICOS) framework (Robinson et al. 2011) to develop our search strategy (Table 1). A search of published literature was subsequently conducted using multiple databases: MEDLINE, CINAHL Plus, Web of Science, Proquest Central. We also searched for grey literature in DISASTERS and ReliefWeb. We used keywords to describe different rapid research designs (i.e. "rapid appraisal", "rapid evaluation", "rapid ethnographic assessment") and emergency contexts (i.e. "outbreak", "epidemic disease", "emergencies"). The full search strategy can be found in Appendix 1 (see 'Supplementary Data'). The searches were conducted in July 2016 and updated in February 2017. Results were combined into RefWorks, and duplicates were removed. The reference lists of included articles were screened to identify additional relevant publications.

– INSERT TABLE 1 HERE –

2.4 Selection and inclusion criteria

Both authors screened the articles in three phases (title, abstract, and full-text) based on the following inclusion criteria: 1) the study was developed in response to a complex health emergency, 2) the study used a rapid research approach, 3) the study used qualitative research methods, and 4) the purpose of the study was to inform the response to the emergency. Any disagreements over the inclusion of an article in the review were discussed until consensus was reached. We did not apply any restrictions in terms of language or date of publication and, in the case of articles that focused on rapid health needs assessments, we only included those that described a new or emerging health concern, or potential outbreak.

Definitions of complex emergencies and disasters abound and the contributions of social scientists to these fields of study, broadly speaking, have been well-documented (Button 1995; Henry 2005; Hoffman 2005; Koons 2010; Oliver-Smith 1996). Our use of the term 'complex health emergency' does not seek to

187 supplant or redefine accepted definitions of complex emergencies and/or disasters, we use this term
188 merely to illustrate that for the focus of this review we were interested in analyzing the work of
189 qualitative researchers working explicitly on health-related issues during emergency events. The
190 working definition we use for a complex health emergency can therefore be defined as a conflict,
191 natural disaster and/or displacement of human populations event that causes, exposes or poses future
192 health risks to vulnerable or marginalized persons which surpasses the ability of affected communities
193 to recover using their own resources (Kulatunga 2010; Lowicki-Zucca et al. 2008; Oliver-Smith 1996;
194 WHO 2002). We have not included cases of chemical hazards in our definition of complex health
195 emergency as this type of hazard requires particular response strategies and has specific effects on
196 health related to toxicity or long-term genetic complications that might not be present in other complex
197 health emergencies and might fall outside of the scope of rapid qualitative research (Clements and
198 Casani 2016).
199
200 We define rapid qualitative research as an approach that uses qualitative methods, or uses qualitative
201 methods in combination with other methodologies, to provide an understanding of the impact of
202 complex health emergencies by collecting and analyzing data within a short period of time (Beebe 2014;
203 Morin et al. 2008; McNall and Foster-Fishman 2007). As Beebe (2014) has argued, it is difficult to
204 establish the 'correct' length of time for a rapid study, as this will depend on the particular characteristic
205 of the study (i.e. purpose, location, context, etc.). In the case of this review, we included articles that
206 self-identified as rapid research (see search strategy in Appendix 1), but excluded those where the
207 process of data collection resembled the length of time of non-rapid research (for instance, studies that
208 exceeded data collection periods of 6 months). We defined qualitative research in relation to the
209 "methodological stances associated with qualitative research" proposed by Snape and Spencer (2003:4).
210
211 ***2.5 Data extraction and management***

The included articles were analyzed using a data extraction form developed in RedCap (Harris et al. 2009). The categories used in the data extraction form are summarized in Appendix 2 (see 'Supplementary Data'). The form was developed after the initial screening of full-text articles, and was then piloted independently by the authors using a random sample of five articles. The form was changed based on the findings from the pilot, mainly to refine the categories and add new data points. Cross-checking of the RedCap online extraction forms was carried out for all articles included in the review. Discrepancies were discussed until consensus was reached. Cases of missing data were dealt with by contacting the authors and also by online searches aimed at collecting background information on the authors.

2.6 Data synthesis

Data were exported from RedCap and the main article characteristics were synthesized. The RedCap report created a quantitative summary of some of the data. The data inputted in free text boxes were exported and analyzed using framework analysis (Spencer et al. 2013). The framework method organizes data in a matrix where rows contain the cases (the reviewed articles in the case of our review), the columns are the codes, and the cells contain the raw data (Gale et al. 2013; Spencer et al. 2013). This approach facilitates the synthesis of data and exploration of patterns by case and code (Gale et al. 2013). The codes were grouped into the following themes: benefits, limitations, difficulties, and recommendations.

2.7 Risk of bias

The assessment of the risk of bias is an important component of systematic reviews (Higgins et al. 2011), We used the Mixed Methods Appraisal Tool (MMAT) to assess the quality of the articles published in peer-reviewed articles (Pluye et al. 2012; Pluye and Hong 2014). We used the AACODS checklist to assess the quality of the grey literature (Chang and Tyndall 2014). All of the articles included in the

review were assessed with the exception of Krumpkamp et al. (2010), as this was not an empirical study. The two authors rated these articles independently. The raters discussed their responses and inter-rater reliability was calculated using the kappa statistic (Landis and Koch 1977). The results from the assessments can be found in Appendix 3 (see 'Supplementary Data').

3. RESULTS

3.1 Identification of articles

The initial search yielded 1444 published articles (Figure 1). These were screened based on title and type of article, resulting in 195. Screening based on abstracts left 51 articles for full-text review. This phase in screening led to 20 articles that met the inclusion criteria. We excluded articles that focused on chemical hazards or emergencies produced by armed conflict as well as those where rapid methods were not used for research purposes (i.e. they were mainly used for diagnostic purposes). Two additional articles were identified by reviewing the bibliography, ultimately leading to 22 articles included in the review.

– INSERT FIGURE 1 HERE –

3.2 Characteristics of included articles

The characteristics of the 22 articles included in the review are presented in Table 2. The articles were published between 2003 and 2016, but we noticed a significant boost in publications from 2014-2016 with 13 articles published between this timeframe (i.e. over half of the full-text articles reviewed). All 13 articles dealt with the Ebola outbreak in West Africa during this time period, indicating a trend towards the use of rapid qualitative assessments for assisting community-based response efforts.

The locations of the studies included a wide range of geographical contexts such as: Afghanistan, Indonesia, Thailand, Pakistan, Uganda, U.S., the Amazon, Liberia, Sierra Leone and Guinea. These last three countries were the locations of more than half of the articles included in the review, all of which centered upon the Ebola outbreak. Almost half of the studies took place in the community, while the rest were carried out in healthcare facilities, government offices, shelters or relief centers. Twelve articles were published in peer-reviewed journals, while ten were reports included in the CDC's Morbidity and Mortality Weekly Report (MMWR).

– INSERT TABLE 2 HERE –

3.3 Complex health emergencies and purpose of the research

When considering the type of complex health emergency, we were able to divide the articles in two main categories: natural disasters with potential health consequences, and epidemic outbreaks (see Table 3). In the case of the articles on the health consequences of natural disasters, rapid research was used to: 1) assess the public health impact of the disaster (mainly on water and sanitation) (Atuyambe et al. 2011; Brennan and Rimba 2005), 2) document existing infrastructure in order to plan humanitarian assistance (Bile et al. 2010; Brahmbhatt et al. 2010; Güereña-Burgueño et al. 2006), or 3) evaluate the effectiveness of response strategies (Broz et al. 2009).

In the case of rapid research for epidemic outbreaks (i.e. *not* natural disasters), there were additional study aims as outlined in the articles reviewed. We were able to group the articles in four main categories based on the purpose of the research: 1) identification of causes of the outbreak and transmission cases, 2) assessment of existing infrastructure and resources, 3) evaluation of control strategies, and 4) analysis of health needs and health facility use during the epidemic. This last category

was frequent in studies on the Ebola response as they sought to address cases of mistrust towards the healthcare system.

– IINSERT TABLE 3 HERE –

All of the articles indicated that the studies were carried out with the purpose of informing ongoing strategies by local government offices or non-governmental organizations. Examples of the translation of findings included: the identification of high-risk areas (Cheung et al. 2003), development of a framework for pandemic planning (Krumpkamp et al. 2010), establishment of new surveillance and case-finding mechanisms (Brahmbhatt et al. 2010; Hagan et al. 2015), prioritization of existing healthcare resources (Pathmanathan et al. 2014), and adjustment of existing interventions (Lee-Kwan et al. 2014)

3.4 Research design

Thirteen of the articles were qualitative studies and nine used a mixed-methods design. Most of the qualitative studies combined interviews with observations (Broz et al. 2009; Forrester et al. 2014a, 2014b; Nielsen et al. 2015; Pathmanathan et al. 2014; Summers et al. 2014), with occasional studies adding focus groups (Carrion Martin et al. 2016; Dynes et al. 2015; Lee-Kwan et al. 2014), documentary analysis (Abramowitz et al. 2015; Krumkamp et al. 2010) or community mapping (Hagan et al. 2015). In the case of the mixed-methods studies, these either combined interviews with structured surveys (Bile et al. 2010; Brahmbhatt et al. 2010; Flores et al. 2011), or interviews and observations with secondary data analysis (Brennan and Rimba 2005; Güereña-Burgueño et al. 2006; Kilmarx et al. 2014; Matanock et al. 2014). Some mixed-methods studies also included focus groups (Atuyambe et al. 2011) and case note reviews (Cheung et al. 2003). The combination of multiple methods and the triangulation of data were seen as effective ways of ensuring the required data were collected within limited timeframes.

The length of the research varied and, in some articles, it was difficult to determine the exact length of data collection. The shortest study was four days (Brennan and Rimba 2005) and the longest was one month (Yamanis et al. 2016), but about half of the studies were carried out within two weeks. Eleven articles described studies where data were collected from healthcare staff or government officials, six studies collected data from community members, four collected data from healthcare staff and community members, and one article did not specify the study participant population. Sample size was not reported in nine of the studies.

3.5 Author background

Since one of the explicit criteria of our search strategy was to focus upon research where the purpose of using rapid qualitative methods was to collect information for informing public health response efforts, it is important to highlight characteristics of the authors which we see as a direct result of this strategy. These characteristics can be grouped into three categories: 1) the number of authors (per article), 2) the interdisciplinary nature of co-authors (per article), and 3) the mixture of emergency response organizations and research institutions paired with governmental entities (per article).

The average number of co-authors per article we reviewed was seven, with a minimum of two authors (Brennan and Rimba 2005) and maximum of 13 (Matanock et al. 2014). While no discernible pattern emerged with regards to the professional background of authors (e.g. epidemiology or anthropology), the departmental affiliations of multiple co-authors clearly illustrate the interdisciplinary nature of rapid research. In 16 of the articles co-authors included a mixture of emergency response organizations and research institutions (e.g. CDC, WHO, UNICEF), paired with governmental health departments (e.g. Department of Health-Pakistan, Ministry of Health and Sanitation-Sierra Leone). With one exception (Yamanis et al. 2016), all articles featured co-authors with affiliations across multiple departments, agencies and/or institutions.

We also explored the types of research teams undergoing fieldwork and found that, in most cases, these tended to be international research teams. Most of the studies mentioned maintaining links with non-governmental organizations and national government offices such as Ministries of Health. Only two of the articles included in the review reported the recruitment and training of local researchers and the use of their knowledge of the local culture and languages during data collection and analysis (Abramowitz et al. 2015; Atuyambe et al. 2011).

3.6 Contributions and limitations of rapid qualitative research

Very few of the articles included in the review critically examined the contributions and limitations of rapid qualitative research in the context of complex health emergencies. The three main contributions of rapid qualitative research outlined by the authors were: 1) the rapid identification of context specific issues that need to be addressed locally (Abramowitz et al. 2015), 2) rapid needs assessment that can act as a guide for resource allocation (Brahmbhatt et al. 2010; Pathmanathan et al. 2014), and 3) provision of data to plan long-term assistance (Güereña-Burgueño et al. 2006). A limitation of rapid qualitative health research can be the low quality of the collected data, as time constraints might have limited access to key informants or other data sources, thus producing gaps during the data collection process (Pathmanathan et al. 2014). The authors also highlight that rapid research designs tend to use small sample sizes, which complicates the generalizability of findings (Brennan and Rimba 2005). Finally, rapid qualitative research might be subjected to bias, in the form of recall, reporting or misclassification bias, with little time for cross-checking facts with other data sources (Brennan and Rimba 2005).

After considering these limitations, some of the authors in the reviewed articles proposed a series of general recommendations for carrying out rapid qualitative research in these settings. Cheung et al. (2003) argue that a factor that can guarantee the success of the research under strict timeframes is the

early designation of community leaders who can act as a point of contact for research teams. This early work with community leaders needs to be done in parallel to the establishment of a network of community, regional, and national agencies where collaborative agreements are created to facilitate the research, but also ensure the continuous dissemination of study findings (Cheung et al. 2003). Findings need to be shared with relevant stakeholders from the time data collection begins. These findings also need to be disseminated in a format that can be used to inform decision-making (Brennan and Rimba 2005) and recommendations need to be developed in conjunction with local policy makers to ensure applicability and acceptance (Krumpkamp et al. 2010).

4. DISCUSSION

4.1 What can we learn from the characteristics of the included studies?

Even though our inclusion criteria were specific, we expected to find more articles that used rapid qualitative methods in complex health emergencies. Our search strategy might have certainly missed some eligible articles, but we feel one of the findings of this review is the lack of dissemination of studies using this type of research design.

We noticed a significant increase in studies using rapid qualitative methods during the last Ebola epidemic. This could in part be due to changes in the approaches used to conduct epidemic investigations in the past decade. In a commentary on the evolution of epidemic investigations and field epidemiology at the CDC, Brachman and Thacker (2011) highlighted an increase in the number of social scientists involved in research teams.

Another important aspect to consider was the fact that grey literature, mainly in the form of reports, seemed to be an important form of output in complex health emergency research, and should therefore be considered in future literature reviews on this topic. As Adams et al. (2016) have argued, grey

401 literature can be used to increase knowledge in areas where scholarship is underdeveloped, draw
402 attention to new topics of inquiry or corroborate existing academic findings.
403
404 ***4.2 What's missing in the research designs?***
405
406 In general, the methodological descriptions in the articles reviewed were not extensive and, in some
407 cases, key data related to sample size and participant populations were not identified, affecting the
408 quality assessment scores of the articles (see Appendix 3). This finding is consistent with other studies of
409 published data collection activities during complex health emergencies. A recently published systematic
410 review on the effect of health interventions in humanitarian crises concluded that there is not enough
411 quality research conducted across health topics of importance to the humanitarian crisis of the last four
412 decades (Blanchet and Roberts 2015). As stated by Blanchet in a recently delivered course on *Health in*
413 *Humanitarian Crisis*, "The humanitarian sector is suffering from the lack of routine data. Not enough
414 data, or not the right data, is systematically, routinely collected" (Blanchet 2017:2). We would add to
415 this that in cases where the right data might be collected, the reporting of the data and data collection
416 methods are not transparently reported, making it difficult to assess the quality of the research and
417 trustworthiness of the data.
418
419 In addition to the lack of information on sample size and populations in the articles included in this
420 review, the timeframes for data collection were 'not specified' in multiple articles (see Table 2) making it
421 difficult to surmise how authors understand 'rapid' data collection (e.g. two days or two months), or if
422 this is even how they would describe their work. There is an unfortunate impression among social
423 science disciplines with historically long-term periods of fieldworks that 'quick' or 'rapid' data collection
424 is not rigorous or reliable (Beebe 2014; McNall and Foster-Fishman 2007). If this impression is to be
425 corrected, and if social science methods are to innovate to help "reduce suffering, improve survival, and
426 ensure better preparedness for future outbreaks" (Henry and Shepler 2015:21) then we must be more

rigorous in publishing our methodologies, more precise in our terminology, and more willing to own the label of 'rapid' (*not* dirty) research. Doing so will enable social science researchers, and the public health managers who rely upon their data, to be more confident in their conclusions, more definite in their recommendations to emergency response agencies, and more candid in how rapid qualitative methods can (and cannot) provide needed data. This will also enable important distinctions to be made between the rapid methods used during initial and acute phases of an emergency, and how they can be adapted and improved upon for more longer-term, longitudinal and traditional forms of monitoring and evaluation which should occur throughout an emergency response.

4.3 Why is author background important?

We can conclude from the background of authors included in this review that rapid qualitative research with the purpose of informing the response to a complex health emergency, requires the collaboration of multiple interdisciplinary researchers with research institutes, UN and I/NGO agencies and governmental health systems. As stated by (Calhoun and Marrett 2008:xxi), "a disproportionate number of major scientific discoveries and innovations involve crossing the boundaries of established disciplines." This highlights the need for social scientists to critically examine how they write and where they publish the results of their work so as not only to reinforce disciplinary boundaries, but also to innovate at the boundaries by building bridges for collaboration, data sharing and knowledge transfer.

4.4 Why utilize rapid qualitative methods?

It is no surprise that the articles culled for full-text review here originate from some of the most recognized public health crises of the 21st century – from the Indian ocean tsunami in 2005 to the Ebola outbreak in West Africa in 2014. As these articles reveal, the health emergencies public health responders have grappled with within the last decade alone challenge the preparedness and response capabilities of international response agencies, national governments and local organizations. When

complex health emergencies occur, multiple forms of interdisciplinary expert knowledge are needed to contribute to the rapid mobilization of response agencies, their personnel, and inter/national governments. As stated by Lurie et al. (2013:1251), the challenges that public health responders have faced since the turn of the century have "underscored a persistent need to be better prepared to resolve important research questions in the context of a public health emergency...additional research, done in parallel with and after the response itself, is often essential to address the most pressing knowledge gaps presented by public health emergencies." Despite this, the importance of utilizing rapid qualitative methods during the complex health emergencies discussed in the articles culled for this review did not extensively (or at all) reflect upon how research designs using rapid methods were able to provide necessary data that other methods could not achieve. To this end, we draw from the articles included in this review, and additional research, to identify several areas in which the use of rapid qualitative data collection and analysis methods, conducted by trained social scientists, can be most useful for quickly responding to complex health emergencies. Critical reflection upon the types of data that rapid qualitative methods in particular can obtain, paired with how findings from rapid research designs may be applied in an emergency, is crucial for advancing social science specialization within this arena.

4.4.1 Responsive to local contexts for drawing on community resilience mechanisms

In the wake of complex health emergencies, community resilience can be defined as "linking a network of adaptive capacities" such as information and communication, and community competence in order to "reduce risk and resource inequalities, engage local people in mitigation, create organizational linkages, [and] boost and support social supports" (Norris et al. 2007:127). Social scientists recognize that communities are not without their own resilience mechanisms which can be mobilized to mitigate public health emergencies, yet previous studies highlight that local knowledge is rarely valued and used

(McKay and DeCarbonel 2016: 64). Social scientists, for example, using qualitative methods during health emergencies, have demonstrated success in developing community-based surveillance tools that are responsive to the capabilities of local communities and which, ultimately, aim to strengthen resilience through participatory community-based approaches (Abramson et al. 2015; Henry 2005; Whiteford and Vindrola-Padros 2015). For instance, Whiteford and Vindrola-Padros (2015) have argued that some community-based models such as the Community Participatory Involvement (CPI) model can help build capacity within communities for controlling and preventing epidemics because they focus on developing and supporting local leadership and ensuring equal participation across sub-groups (i.e. women, young people, etc.). Development of contextually-relevant research tools and mechanisms for community engagement which consider the assets and capacities of affected communities is needed at all phases of an emergency in order to be reflective of pre-emergency community contexts, responsive to the altered environment created during an emergency response, and capable of considering how systems set-up during an emergency will affect communities once the health crisis has resolved and/or public health response agencies are no longer involved (Koons 2010; McKay and DeCarbonel 2016).

4.4.2 Responsive to rumors and associated population-level behaviours

Rumors and misconceptions thrive during periods of social duress, particularly in the absence of clear communication guidelines and trusted channels for delivering health messages (Briggs 2011; Hewlett and Hewlett 2008; Schoch-Spana 2000). This is something health managers need to grapple with in dealing with both infectious disease threats, as well as routine public health challenges (e.g. vaccination campaigns). Using secondary data analysis (e.g. systematic literature reviews) and qualitative data collection techniques (e.g. interviews with key medical personnel), researchers can help to contextualize rumors by explaining local rationale behind and identifying how beliefs may influence the behaviors of affected populations. Longitudinal data collection among populations affected by complex health

emergencies also serves as an important reminder to emergency responders to not assume they know what is in the minds affected populations, nor think perceptions will remain static throughout an emergency operation. Qualitative methods can also help emergency public health responders quickly identify the sources that affected population trust and listen to the most (for delivering key public health messages), and for assessing whether or not these persons have accurate and up-to-date information (Briggs and Mantini-Briggs 2003).

4.4.3 Able to reveal societal tensions which disproportionately affect marginalized populations

The complexity of how diseases interact with human populations when introduced into unique environmental, biological, and sociocultural settings is something which specialized subfields, such as medical anthropology, are well-versed in researching (Hoffman 2015). Further, social science disciplines have an extensive history of critically engaging socio-cultural realities which marginalize, exclude or make vulnerable certain populations. As many veteran emergency managers can attest, societal tensions – particularly those which have been politically repressed or ignored – reveal themselves most during times of crisis amidst the fears and uncertainties which disasters inspire (Blaikie et al. 1994). As an example, anthropologists have commented extensively on how Hurricane Katrina, one of the deadliest hurricanes in US history, revealed deep-rooted currents of racial and economic discrimination against those most affected by the disaster (Hoffman 2005; Scheper-Hughes 2005). Insights such as these are vital to emergency health planners for identifying and responding to the unique needs of at-risk groups – before, during and after an emergency. These are concepts which should immediately factor into how emergency response operations are designed, executed and, ultimately, how they are dismantled after the crisis is over.

4.4.4 Useful to study organizational challenges of response efforts to highlight gaps and omissions

526 At a 2014 panel entitled 'Ebola in Focus' of the American Anthropological Association (AAA) annual
527 meeting, panelists from WHO, UNICEF and MSF concluded that "We need a humanitarian anthropology
528 that is embedded in that response, yet is able to be critical of it" (Henry and Shepler 2015:21). Complex
529 emergency events place new stresses on donors, organizations and individuals who may not be familiar
530 with responding to a health crisis, but are nonetheless tasked with its execution (Mahapatra 2014;
531 Oliver-Smith 1979). For unanticipated emergency events, local response organizations must quickly shift
532 their priorities, personnel and budgets all of which can create confusion in the flow of information,
533 chains of command and worker roles and responsibilities (Mahapatra 2014). As the articles included in
534 this review have demonstrated, qualitative research methodologies that "capture human behavior at its
535 most open, realistic moments" during an emergency need not be limited solely to work at the
536 community-level (Mahapatra 2014:241). These same methodologies are also useful for studying
537 organizational challenges and "bureaucratic rigidities" encountered during complex response operations
538 (Mahapatra 2014:241). Capturing the experiences, needs and lessons learned from the work of
539 emergency response personnel which might otherwise go undocumented in the rush to bring aid, can
540 help to illuminate these 'rigidities'. As noted by Henry (2005), the top-down approach taken by most
541 specialized, international disaster relief organizations may lead to the failure of on-going operations and,
542 ultimately, impact the sustainability of recovery programming.
543
544 ***4.5 Limitations of the review***
545 This review has a series of limitations and the findings should be interpreted with these in mind. The
546 literature search was initially carried out in July 2016 and updated in February 2017, therefore any
547 articles published after this date have not been included in this review. Although we used multiple
548 broad search terms and developed our search strategy using the PICOS framework, it is possible that we
549 missed peer-reviewed articles and grey literature that did not use these terms. Our decision to include

grey literature in the review was based on the fact that much of the research carried out in this field is not normally published in peer-reviewed journals. We were able to capture a significant number of reports in our grey literature searches, but we might have missed studies where the researchers were not able to share findings beyond the organizations where they worked (i.e. due to proprietary data issues). Upon this point, it is important to note the structural barriers involved in researching complex health emergencies which may have prevented social science researchers from publishing the results of their rapid studies in either grey literature or academic sources. Rapid qualitative research for responding to complex emergencies is often conducted on behalf of organizations who use data for informing their own individual response efforts. For researchers who have been contracted to work for these organizations, the data they collect most often belongs to the organization, not themselves. As such, publication of 'internal' data may not be a priority or even a desire of organizations who do not want the results made available to a larger audience. This is particularly true where data reveals organizationally or political sensitive information. Further, academic publication sources often require proof that a formal IRB process has been systematically followed by those engaged in research with human populations. For professional social scientists responding quickly to a crisis, it may not be feasible (or ethical) to halt their work while waiting on formal approval from an official review body. In addition, regions or countries which have experienced long-term crisis (e.g. civil war), or those who have been crippled by a sudden and unexpected health emergency (e.g. Ebola), may not have a functioning review system in place.

We defined qualitative research based on the definition proposed by Snape and Spencer (2003). This definition was selected because we felt it captured various dimensions of qualitative research (perspectives, design, data generation, research methods, analysis, and outputs). However, use of this definition might have resulted in our missing studies that defined qualitative research differently. Our

decision to narrow the scope of the review to epidemics and exclude armed conflicts and chemical hazards also limits the findings of the review. We believe that future reviews could be carried out on the use of rapid qualitative research in the context of armed conflicts and chemical hazards. An overview of these reviews in the form of an umbrella review (Baker et al. 2014; Smith et al. 2011) could then compare how rapid qualitative methods are used across these contexts and identify similarities and differences in their application.

5. CONCLUDING THOUGHTS

Within the last 15 years, the CDC has remarked on the need for increased collaboration with social scientists, specifically anthropologists, during complex emergencies. Williams (2001) has stated that while anthropological input may be, theoretically speaking, valued among public health professionals, in reality "applied anthropologists rarely have been teamed with public health practitioners in the arena of complex emergencies" (Williams 2001:4). Recent public health international emergencies (PHIE) such as Ebola have prominently featured the strengths (and sometimes weaknesses) of social scientists responding to disease outbreaks, which could spur the systemic changes necessary for interdisciplinary collaboration in the future. Given the unprecedented nature of the Ebola outbreak in West Africa, both in terms of scale and duration, it remains to be seen whether or not the trend towards a boost in social science publications (as evidenced from 2014-2016) will continue in the future with regards to the use of rapid qualitative studies during health emergencies in non-Ebola settings. However, the increased use of social scientists during the Ebola outbreak has been sustained in subsequent outbreaks (e.g. the Zika outbreak of 2015-16), and the trend towards bringing social science knowledge and capacity to better understanding and addressing acute phase complex health emergencies has taken root at the highest policy-level (e.g. WHO Social Science Interventions Team).

There is a tendency in the social sciences, and the discipline of anthropology in particular, to equate in-depth research with long-term fieldwork. However, several authors have argued that long-term fieldwork is not suitable for all research topics and contexts and the quality of the research should not be assessed based on the amount of time researchers spend in the field (Beebe 2014; Pink and Morgan 2013). As noted by Abramowitz et al. (2015), traditionally deployed anthropological methods involving significant time spent in the field prior to reporting on a situation, could potentially limit the contributions of these qualitative methods to emergency response efforts.

What is evident from our review is that social scientists have been engaging in rapidly conducted research during complex health emergencies for some time, but there was a notable increase in this type of research design using explicit 'rapid' methods during the Ebola epidemic. All of the studies in the reviewed articles were developed to inform responses to disasters and epidemics and were carried out by interdisciplinary and multi-organizational teams. The pressures created by rapid research design led several researchers to develop community-based networks to facilitate quick immersion in the field and targeted collection of data. These networks were also used to disseminate findings and inform decision-making.

Social science researchers need to be present at the beginning of an emergency health response to set in place systems for data collection which are relevant, sustainable and draw from a diverse array of methodologies depending on contextual realities on the ground. Social science research was not sought during the Ebola outbreak until several months after the outbreak was discovered and after multiple failed attempts at communication with communities who were frightened of Ebola responders and were not observing infection control measures. In order to have an early seat 'at the table' and be relevant at the outset of an emergency, social science researchers will need to find new and innovative ways for

624 adapting methods for rapid data collection to address the most pressing needs during the early phases
625 of an intervention, and they will need to be good communicators with public health managers as to how
626 their data can and should be applied to mitigate the effects of the emergency and increase the
627 effectiveness of the response.
628
629 A significant amount of work remains to further develop the use of rapid qualitative research
630 approaches in the emergency context. In order to move forward, it is essential for social scientists to
631 critically reflect on the benefits as well as drawbacks of these methods in order to incorporate lessons
632 learned into future emergency response operations. As stated above, critical reflection upon the types
633 of data that rapid qualitative methods in particular can obtain during complex health emergencies is
634 crucial for advancing social science specialization within this arena. We have included in this article
635 several areas of inquiry in which social science knowledge and methods have been most beneficial
636 during periods of crisis, however, this listing is not exhaustive and only hints at the benefits to be gained
637 by engaging trained social scientists during emergencies. We therefore invite scholars to continue the
638 trend established by the Ebola outbreak in publishing the results of rapid qualitative research.
639 Publication of such work needs to 1) rigorously define and describe the methodologies used, and 2)
640 explicitly state how these methodologies were able to collect data necessary for informing public health
641 response efforts. This can be achieved through both traditional academic and grey literature sources (as
642 utilized for this review), and via informational platforms established with the express purpose of
643 disseminating data through interdisciplinary collaboration (e.g. Ebola Anthropology Response Platform,
644 Society for Medical Anthropology's Zika Pop-up Interest Group). Platforms such as these provide
645 important examples of the benefits to be gained from collaboration among a concerned group of
646 scholars and require, at a minimum, recognition among all interested parties (e.g. response agencies,
647 research institutions, practitioners) of the need to disseminate data in 'real time.'

As stated in the limitations section of this review, due to the multiple structural barriers which prevent publication of social science data during complex emergencies, it is likely that our search strategy did not return research results which would help to further the work of social scientists within this field. We therefore hope this review will aid social science efforts to open up spaces where scientists can remediate the barriers which prevent us from learning from each other within the critically important arena of complex health emergencies.

6. SUPPLEMENTARY DATA

– INSERT LINK TO ONLINE FILES: APPENDIX 1, APPENDIX 2, & APPENDIX 3 –

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985 **Figure 1 – Study selection procedure.**
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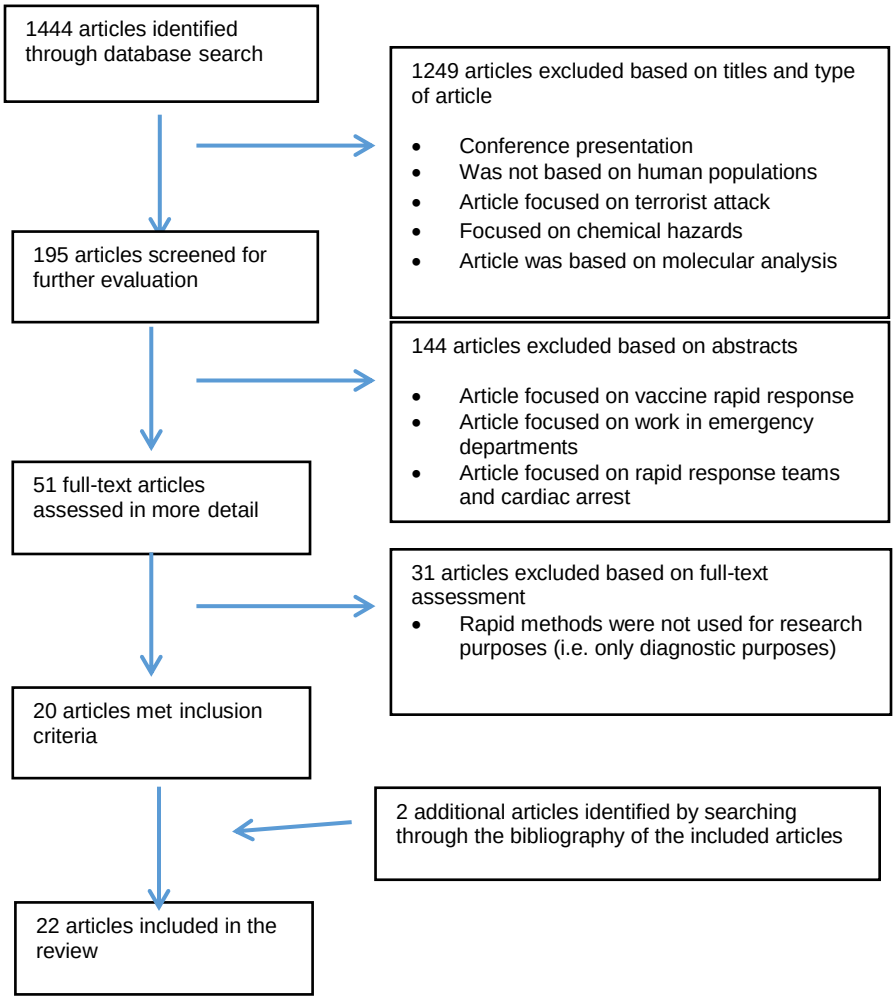

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990 **Table 1 – PICOS framework used to develop search strategy.**
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PICOS Element	Definition
Population	Complex health emergency
Intervention	Rapid assessment, evaluation, or study using qualitative methods or combining qualitative methods with other methods (mixed-methods)
Comparison	No intervention (i.e. non bio-medical or clinical-based study)
Outcomes	The purpose of the rapid assessment/evaluation/study is to collect information that is used to inform the response to the complex health emergency
Setting	Rapid study, assessment or evaluation that took place in a non-clinical setting (e.g. community-based setting)

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Table 2 – Main characteristics of articles included in the review.

First author name	Year	Location and type of setting	Type of complex health emergency	Study aims	Timeframe for data collection	Research design	Research methods Type of research team	Sample size and population	Use of research findings
Cheung, E. et al.	2003	Afghanistan Setting: Rural community	Outbreak Scurvy	Identification of scurvy outbreaks and monitoring of an intervention	A few days (exact number not specified)	Mixed methods	Focus groups; Case note reviews International and national "monitoring" teams	120 community members in 15 focus groups (groups with men and women, inclusion of village leaders)	Identification of high-risk areas for targeting interventions
Brennan and Rimba	2005	Indonesia Setting: Rural community	Natural disaster Tsunami	Determine the public health impact of a tsunami	4 days	Mixed methods	Observations; Focus groups; Surveys; Secondary data analysis International and national research teams	Survey among 32 households Focus group with women from the community sample size not specified	Informed the International Rescue Committee's response
Güereña-Burgueño, F. et al.	2006	Thailand Setting: Healthcare facilities	Natural disaster Tsunami	Rapid health needs assessment to plan and execute humanitarian assistance	7 days	Mixed methods	Interviews; Observations; Secondary data analysis International and national research teams	Administrative and clinical staff from 12 hospitals	Informed US humanitarian assistance strategies

Broz, D. et al.	2009	USA Setting: Relief center	Natural disaster Hurricane	Effectiveness of response strategy to provide health care to Hurricane Katrina evacuees	11 days	Qualitative	Interviews; Observations National research team	33 staff members (clinicians and non-clinical support staff)	Informed the response directed by the Chicago Department of Public Health
Krumkamp, R., et al.	2010	N/A	Outbreak Influenza	Systematic assessment of the national health system capacity to respond to pandemic influenza	Not specified	Qualitative	Interviews; Documentary analysis	Not specified	Developed a new framework for pandemic planning
Bile, K. M. et al.	2010	Pakistan Setting: Government offices and healthcare facilities	Natural disaster Earthquake, cyclone and floods	Effective coordination, joint planning, distribution of roles and responsibilities, and resource mobilization between partners	A few days (exact number not specified)	Mixed methods	Survey; Informal interviews (described as 'consultations') International and national research teams	Government, humanitarian agencies, and other partners Sample sizes not specified	Informed the response to enhance primary care and hospital capacities
Brahmbhatt, D. et al.	2010	USA Setting: Shelter	Natural disaster Hurricane	Evaluate the composition, pre-deployment training and recognition of scenarios with	8 days	Mixed methods	Interviews; Surveys National research team	43 shelter staff members (including volunteers, nurses, medical technicians, and assistants)	Informed the response by providing a disease burden assessment and establishing surveillance

				outbreak potential by shelter health staff					mechanisms
Atuyambe, L. et al.	2011	Uganda Settings: Community, healthcare facilities	Natural disaster Land slide	Assessment of water, sanitation and hygiene to inform interventions	5 days	Mixed methods	Interviews; Observations; Focus groups; Surveys Led by national research team, but local research assistants (familiar with local culture and language) were recruited and trained	28-44 camp residents in focus groups; 27 health care providers, humanitarian agency workers, district health officials, and local leaders in interviews; 397 camp residents in survey	Informed interventions directed by the Ministry of Health and the Ministry of Relief, Disaster Preparedness and Refugees
Flores, W. et al.	2011	Amazon sub-region Setting: Government offices and departments	Outbreak Malaria	Rapid assessment of the performance of four malaria control strategies	Not specified	Mixed methods	Interviews; Surveys National and international research teams	120 government authorities and PAHO advisors	Informed regional malaria control strategies
Forrester, J. et al. *	2014a	Liberia Setting: Healthcare facilities	Outbreak Ebola	Assessment of Ebola case burden, health care infrastructure, and	9 days	Qualitative	Interviews; Observations National and international research teams	HCWs (health officials, hospital administrators, clinicians, and health	Informed the Ebola response strategy organized by the Liberian Ministry of Health and

				emergency preparedness				educators) Sample size not specified	Social Welfare
Forrester, J., et al. *	2014b	Liberia Setting: Healthcare facilities	Outbreak Ebola	Rapid evaluation to identify cases of Ebola transmission among HCWs and possible sources of exposure	5 days	Qualitative	Interviews; Observations International research team (CDC)	Infected HCWs, staff members and volunteers at ETU Sample size not specified	Informed the Ebola response strategy organized by the Liberian Ministry of Health and Social Welfare
Matanock, A. et al. *	2014	Liberia Setting: Healthcare facilities	Outbreak Ebola	Assessment of Ebola virus disease cases among health care workers not working in Ebola treatment units	Not specified	Mixed methods	Interviews; Secondary data analysis; Observations National and international research teams	County health officials and contact tracers Sample size not specified	Informed the Ebola response strategy organized by the Liberian Ministry of Health and Social Welfare
Pathmanathan, I. et al. *	2014	Sierra Leone Setting: Healthcare facilities	Outbreak Ebola	Identify existing resources and high priority outbreak response needs	5 days	Qualitative	Interviews; Observations International research team (CDC)	Administrative and clinical staff in 12 health facilities (including the medical officer and senior clinicians)	Allowed the Sierra Leone Ministry of Health and Sanitation to prioritize prevention and control resources
Summers, A., et al. *	2014	Liberia	Outbreak	Identify county-	15 days	Qualitative	Interviews; Observations	Healthcare workers	Informed the Ebola response

		Setting: Healthcare facilities	Ebola	specific challenges in executing Ebola response plans, and to provide recommendations and training to enhance control efforts			International research team (CDC)	Sample size not specified	plans directed by the Liberian Ministry of Health and Social Welfare
Lee-Kwan, S., et al. *	2014	Sierra Leone Setting: Community and counselling sessions	Outbreak Ebola	Assessment of Ebola virus disease survivor needs	30 days	Qualitative	Interviews; Observations; Focus groups National and international research team involving multiple organizations	87 survivors in focus groups 12 survivors in interviews Observations during 6 wellness sessions	Informed improvements in survivor services directed by Emergency Operations Center staff and partners
Kilmarx, P., et al. *	2014	Sierra Leone Setting: Healthcare facilities	Outbreak Ebola	Characterize risk of Ebola virus disease infection for HCWs and guide prevention efforts	Not specified	Mixed methods	Interviews; Observations; Secondary data analysis International research team (led by CDC)	HCWs and health facility administrators Sample size not specified	Guided prevention efforts and controlled infection by HCWs
Abramowitz, S., et al.	2015	Liberia	Outbreak Ebola	Provide baseline information on	20 days	Qualitative	Focus groups; Observations; Documentary analysis	368 community leaders took part in 15 focus groups	Informed program design and evaluation directed by the

		Setting: Community		community-based epidemic control priorities and identify local strategies for containing the epidemic			Local research teams led and trained by external lead (applied medical anthropologist)		WHO and the Government of Liberia
Dynes, M., et al. *	2015	Sierra Leone Setting: Community and healthcare facilities	Outbreak Ebola	Assess attitudes and perceptions regarding the risk for Ebola and health facility use to increase use of maternal and newborn health services	30 days	Qualitative	Focus groups National and international research teams	34 HCWs and 27 pregnant and lactating women	Informed response strategy directed by the Sierra Leone Ministry of Health and Sanitation
Nielsen, C., et al.*	2015	Sierra Leone Setting: Community	Outbreak Ebola	Assessment of burial practices, cemetery management, and adherence to practices recommended to reduce the risk for Ebola virus	5 days	Qualitative	Interviews; Observations National and international research teams	15 community members and 12 burial team supervisors	Informed response strategy directed by the Sierra Leone Ministry of Health and Sanitation

				transmission					
Hagan, J., et al. *	2015	Liberia Setting: Community	Outbreak Ebola	Assess area needs and guide response efforts	5 days	Qualitative	Case finding; Area mapping; Interviews Research team composed of CDC team members and county health team	Village leaders and community representatives Sample size not specified	Led to the creation of a process of active case finding
Carrion Martin, A., et al.	2016	Guinea Setting: Community	Outbreak Ebola	Identify sociocultural determinants related to community resistance	Not specified	Qualitative	Observations; Interviews; Focus groups International research team	5 key informants (interviews) 10 healthcare workers and survivors (focus groups)	Informed the strategies implemented by local WHO teams
Yamanis, T., et al.	2016	Sierra Leone Setting: Community	Outbreak Ebola	Explore the barriers preventing lack of trust and use of the Ebola response system during the outbreak	2 months	Qualitative	Interviews International research team	30 community members	Informed local response efforts

PAHO: Pan American Health Organization
HCWs: Health Care Workers
ETU: Ebola Treatment Unit
* Grey literature

Table 3 – Aims of rapid research.

Identification of causes of the outbreak and transmission cases	**Assessment of existing infrastructure and resources**	**Evaluation of control strategies and other interventions**	**Analysis of usage of health facility/services and health needs**
Identification of causes of the outbreak (Cheung et al. 2003)	Assessment of capacity to respond to the outbreak (Krumkamp et al. 2010)	Assessment of control strategies (Broz et al. 2009; Flores et al. 2011)	Analysis of the barriers behind lack of health facility use (Carrion Martin et al. 2016; Dynes et al. 2015; Yamanis et al. 2016)
Identification of cases of transmission (Abramovitz et al. 2015; **Forrester et al. 2014b;** Kilmarx et al. 2014; **Matanock et al. 2014; Nielsen et al. 2015)**	Assessment of infrastructure (including water and sanitation facilities) and disease burden (Atuyambe et al. 2011; Bile et al. 2010; Brahmbhatt et al. 2010; Brennan and Rimba 2005; Forrester et al. 2014a; Güereña-Burgueño et al. 2006;)	Enhancement of control efforts (Summers et al. 2014)	Identification of survivor needs (Lee-Kwan et al. 2014)
--	Assessment of existing resources (Hagan et al. 2015; Pathmanathan et al. 2014)	--	--